Department of Environmental Quality
Remediation Division
Petroleum Release Section

Technical Guidance Document #9
Petroleum Release Closure
(Categorizing Petroleum Releases as Resolved)

Petroleum Release Closure Criteria

The DEQ PRS evaluates closure requests based upon site-specific criteria. Specific closure criteria are defined in the Petroleum Release Closure Checklist (Appendix A) attached.

Closure Request to DEQ PRS

An owner or operator (O/O), their designated representative, or DEQ program staff may request the department to close a site and categorize it as a resolved release. The request may occur at any time after specific phases of investigation, risk evaluation, or cleanup have been completed. An O/O or designated representative should discuss the site's potential for closure with the Petroleum Release Section (PRS) project manager (PM) and review the criteria presented in this document, including Appendix A, to determine whether the site is eligible for closure. It is the responsibility of the requestor to provide all documentation necessary to confirm that DEQ closure criteria have been adequately addressed.

The PM will complete an initial technical review of a closure checklist within 30 days of receipt of the checklist. If the PM identifies deficiencies that indicate the site cannot be closed, the PM will notify the requestor and attempt to resolve the deficiencies within 45 days of receipt of the request. If the deficiencies cannot be resolved, the PM shall notify the requestor, and explain the deficiencies and rationale for not approving the closure request and discuss what additional work is required to reach closure.

Once all deficiencies have been resolved, the PM will prepare a Closure Summary Sheet (Appendix C) for internal review to ensure accuracy, validity, and consistency. An internal review team of four senior PMs within the DEQ PRS will conduct this review. The DEQ PRS Supervisor will advise the review team, and will consider previous closure determinations to ensure consistency during the closure review process.

The DEQ PRS will complete the closure review process within 60 calendar days of receipt of the request, except in cases of extreme workload conditions. If the DEQ PRS cannot review the closure request within 60 days, the DEQ Remediation Division Administrator may extend the review period by an additional 30 days. If the time period is extended, the PM will notify the person submitting the request of the need for an extension. Closure reviews initiated by the DEQ PRS that are not requested by the O/O or their representatives do not require a review process time limit.

Notification of Closure Decision
The PM will notify the O/O and the person requesting closure of the department's decision with regard t closure request, and provide the department's rationale for the decision. The rationale shall explain any criteria preventing closure. The notice will also inform the O/O that they may request a meeting with DEQ PRS personnel to discus the closure decision. The O/O may also submit additional information to resolve issues identified during the closure review.

Closure Approval and Issuance of No Further Corrective Action Letter
If the DEQ PRS approves the closure request, the site will be categorized as a resolved release. The PM will mail a standard "No Further Corrective Action letter" (Appendix C) to the O/O and any other person who completed the request on behalf of the O/O. The PM will also notify the Information Services Section that the release is to be categorized as resolved on the department's database.

Remediation System Evaluation
If an in-situ remediation technology has been used to clean up a contaminated vadose or saturated zone, performance monitoring is required to verify that the remediation method has been successful. DEQ typically requires source-area sampling (via soil borings or groundwater via monitoring wells) as appropriate to verify the effectiveness of the remediation system and to decide whether additional cleanup is required. Confirmatory soil samples or groundwater monitoring also provides documentation of endpoint contaminant levels (i.e. residual contaminant concentrations) in the soil or groundwater at the time of closure. If performance monitoring indicates that contaminant levels exceed the risk-based screening levels (RBSLs) or WQB-7 values, then additional remediation using either the existing remediation system or another method may be required to target the remaining contamination.

Cessation of active in-situ remediation (e.g., turning of an ineffective soil vapor extraction system) may not eliminate the need for continued groundwater monitoring. Additional groundwater monitoring may be necessary to verify the continued decline in contaminant concentrations for some period of time. Sampling requirements and reduced frequency of sampling over extended periods of time are discussed in Technical Guidance Document #12, Groundwater Monitoring.

References:
ARM 17.56.605(6)
ARM 17.56.605(8)

Updated September 30, 2003

Appendix A

Petroleum Release Closure Checklist

Petroleum Release Closure Criteria

The DEQ PRS evaluates releases for formal closure based upon three primary areas of concern. All three areas must be addressed before a release can be considered for closure. These three areas are:

I. The Primary Areas of Concern

A. Protectiveness

The release cannot pose unacceptable risks to public health and the environment. Data typically evaluated to determine risk includes, but not limited to depth to groundwater, contaminant type, contaminant mobility, type of receptors, distance to receptors, and the contaminant's calculated fate and transport potential.

B. Environmental requirements

The release must meet applicable and relevant environmental laws and requirements. Examples of these requirements include, but not limited to compliance with the following laws: Montana's Underground Storage Tank Act, Montana Water Quality Act (WQA), federal Resource Conservation and Recovery Act (RCRA), and public nuisance.

C. Adequate information

A thorough and viable investigation must be conducted in accordance with Montana underground storage tank rules (ARM 17.56.603-604) to adequately evaluate whether protectiveness and compliance with applicable environmental requirements have been properly met.

II Closure Checklist

A checklist based on the three primary areas of concern, listed in Section I, is used as a screening tool by the DEQ-PRS Staff to determine whether a release is eligible for formal closure. The checklist includes specific closure criteria that must be adequately addressed prior to release closure. The closure checklist states the closure criteria as question that must be answered 'yes' before a release may be deemed eligible for closure. Applicable references are shown in *[bracketed italics]*. If a specific criterion does not apply to a given release, a written explanation must be provided clearly stating why the item does not apply.

A. General *[ARM 17.56.602-605 and DEQ Technical Guidance]*

1. **YES**___NO___ Has a concise case history been prepared with a thorough presentation of all data? *[ARM 17.56.603(1) and (2)]*

2. **YES**___NO___ Has a complete site map and soil profile map been prepared that shows former and current USTs, ASTs, excavations, dispensers, underground piping, sample locations, neighboring property, utilities, streets, etc? *[ARM 17.56.603(1)(c)]*

3. **YES**___NO___ Is a complete communication record available (24-hour and 30-day reports, release letter, etc.)? *[ARM 17.56.602, 603, 604, and 605 and DEQ Technical Guidance]*

4. **YES**___NO___ Have all portions of the PST system, or other sources identified as part of this release, such as piping, dispenser islands, and attached PSTs, been investigated? *[ARM 17.56.602(1) and (2), and 17.56.604(1), (2) and (3)]*

5. **YES**___NO___ Have all potential human or sensitive environment exposure pathways been identified and evaluated?

6. **YES**___NO___ Does evaluation of all identified human and environmental exposure pathways indicate that there is no unacceptable exposure or risk to potential receptors?

B. Analytical *[ARM 17.56.604(g) and DEQ Technical Guidance]*

1. **YES**___NO___ Have proper soil and water sampling and handling procedures been practiced (holding time, preservative, cold storage and shipping, minimal headspace in soil samples, no headspace in VOAs, etc.) for all samples supporting the closure decision? *[The Montana Quality Assurance Plan for Investigation of UST releases, reference by ARM 17.56.504(2). This document is also know as the "Quality Assurance Project Plan, For The Montana Department of Environmental Quality Leaking Underground Storage Tank Program, Revised June 8, 1999"]*

2. **YES**___NO___ Are the analytical methods and PQLs appropriate for the chemicals of concern? *[The Montana Quality Assurance Plan for Investigation of UST releases, reference by ARM 17.56.504(2])*

3. **YES**___NO___ Are the chain-of-custody, sample receipt forms, chromatograms, and QA/QC present and complete? *[The Montana Quality Assurance Plan for Investigation of UST releases, reference by ARM 17.56.504(2])*

C. Soil *[ARM 17.56.604-605 and DEQ Technical Guidance]*

1. **YES**___NO___ Are laboratory analytical data available for worst-case soil samples prior to cleanup? *[ARM 17.56.602(e)]*

2. **YES**___NO___ Is a soil boring available to determine maximum depth of contamination located within the contaminant migration path? *[ARM 17.56.602(e)]*

3. **YES**___NO___ Does the soil boring data provide the soil sample depth relative to ground surface? *[The Montana Quality Assurance Plan for Investigation of UST releases, reference by ARM 17.56.504(2)]*

4. **YES**___NO___ Has confirmation sampling been conducted (discrete samples, not composites) after over-excavation? [*The Montana Quality Assurance Plan for Investigation of UST releases, reference by ARM 17.56.504(2)]*

5. **YES**___NO___ Has confirmation sampling been conducted after in-situ remediation (post SVE, air-sparge, etc.)? *[ARM 17.56.605(6)]*

6. **YES**___NO___ Is the vertical and horizontal extent of contaminated zone defined? *[ARM 17.56.604(3)(f)(ii)(A), ARM 17.56.602(2)(e), and the Montana Quality Assurance Plan for Investigation of UST releases, reference by ARM 17.56.504(2)]*

7. **YES**___NO___ Is the residual contaminant (contamination remaining after remediation) extent and magnitude defined and not exceeding Montana Tier 1 Risk-Based Screening Levels (RBSLs)? If Tier 1 RBSLs are exceeded in soil, as approved by DEQ-PRS, alternative methods (e.g., groundwater monitoring) may be used to evaluate leaching potential.

D. Ex-situ Contaminant Treatment or Disposal

1. **YES** ___NO___ Has confirmation sampling been conducted after ex-situ remediation (e.g. landfarm performance monitoring, etc.)? *[ARM 17.56.605(6) and Technical Guidance]*

2. **YES**___NO___ Is the disposition adequately documented for contaminated soil that was transported to a landfill, commercial landfarm, etc?

3. **YES**___NO___ Is the disposition adequately documented for contaminated water, sludge, and other liquid wastes transported offsite?

E. Groundwater Monitoring *[ARM 17.56.604-605 and DEQ Technical Guidance]*

1. **YES**___NO___ Has groundwater monitoring been conducted at the worst-case location, or at a maximum 10 feet down-gradient of the worst-case location, unless precluded by site conditions? *[ARM 17.56.604(3)(f)(ii) and Technical Guidance]*

2. **YES**___NO___ Is the depth to groundwater (the first saturated zone) known? *[ARM 17.56.604(c)(i)(B)]*

3. **YES**___NO___ Are contaminant concentrations less than numerical water quality (WQB-7) standards and Tier 1 Risk Based Screening Levels (RBSLs) in the first groundwater beneath the release/source? This is the point of compliance for measuring groundwater impact. *[ARM 17.56.604(3)(f)(ii)(c)]* Note: If only RBSLs, not WQB-7 standards, are exceeded, the release may still be closed based on evaluation of risks to human health and the environment.

4. **YES**___NO___ Does successive, seasonal groundwater monitoring indicate that WQB-7 Standards are not exceeded? *[ARM 17.56.605(6)]*. If groundwater RBSLs are exceeded, then has another method approved by DEQ-PRS assessed the risks to applicable receptors?

5. **YES**___NO___ Are monitoring well locations appropriate to define the extent and magnitude of contamination? *[ARM 17.56.604-605]*

6. **YES**___NO___ Are monitoring wells installed and constructed properly (screened across the water table, etc.)? *[ARM 36.21.800]*

7. **YES**___NO___ Has first groundwater been sampled, if preferential pathway contaminant migration ("fingering") has possibly occurred in soil?

F. Utility Corridors, Water Wells and Other Receptors *[ARM 17.56.602-605; MCA 75-11-514 and DEQ Technical Guidance]*

1. **YES**___NO___ Are utilities and utility trenches located on the site map?

2. **YES**___NO___ If migrations of NAPL or vapors has occurred in a utility trench, has the potential route been investigated?

3. **YES**___NO___ If a water well has been potentially impacted, has it been sampled for appropriate chemicals (VOCs, etc.)?

4. **YES**___NO___ Have water main, service line, and gasket construction (PE, PVC, steel, copper, etc.) been identified?

5. **YES**___NO___ If permeation or infiltration potential exists, has the water main or service line water been sampled?

Appendix B

No Further Corrective Action Letter (Example)

(Date)

(Address)

Subject: No Further Corrective Action Required for the Petroleum Release at (facility name), (address), MT, **FACILITY ID# xxxxxx, DEQ RELEASE# xxxx**

Dear Mr./Ms.:

The Department of Environmental Quality has reviewed the information associated with the petroleum release at the above-referenced location. Based on the available information, it appears that the corrective action was proper and that no further investigation or cleanup activities needed. You may still be responsible for any damages not yet identified resulting from leaks, spills, or improper closure of the tank(s).

The decision that no further corrective action is required is based on the following:

- (be specific, indicate residual contamination if present, include concentrations of residual contamination groundwater and soil as of the most recent sampling event)
- If residual contamination is in place, describe any institutional controls that must be maintained (i.e. development restrictions)

The DEQ will maintain your release file so that if you need any information in the future or if new problems with your site arise, it can be accessed easily. If you still have outstanding permit requirements or fees due, the Technical Services Bureau's Environmental Services Section will contact you separately.

<u>Optional paragraph for sites with other petroleum sources not related to the release:</u>
This letter only applies to petroleum storage tank systems associated with Release # xxxx, and not to other potential sources of petroleum located at this facility. Areas examined during this investigation and cleanup only include….

The DEQ reserves the right to require further remedial action at this site upon receipt of new or different information indicating that further remedial action is warranted such as changed site conditions or information that a release has occurred.

If you have any questions concerning this letter please contact this office at (406) 444-1420. The department appreciates your cooperation concerning corrective action requirements. Working together to achieve the cleanup of this release enables us both to ensure protection of public health and the environment.

Sincerely,

(project manager)
Environmental Specialist

cc: PFSS
Facility file

Appendix C

PRS Closure Summary Form

MONTANA DEQ, PETROLEUM RELEASE SECTION
PETROLEUM RELEASE CLOSE-OUT FORM
(to be completed by DEQ-PRS staff)

FAC. ID#:
RELEASE #:

SITE NAME:

DATE OF DISCOVERY:

LOCATION: ____1/4,____1/4 , Sec.____, T_____, R
(Street)
(County) _____ (City) _____ (ZIP)

PROJECT MANAGER:

PRIORITY RANKING: (H, M, L)

DEQ PRIORITY RANKING NUMBER:

CONSULTANT NAME:

CONTAMINANT TYPE: Gas ___, Diesel ____, Other

SOURCE: UST _____, AST ___, Piping ____, Spill
Other

Estimated volume of release (if known): _____ Gallons

CONTAMINANT FOUND IN: Soil ____, Groundwater

SOIL PROFILE:

GROUNDWATER: Depth to:
GW flow direction:
How determined?

POTENTIAL RECEPTOR: (elaborate how investigated in Summary)

Check (Y/N) if:	Thrtnd	Impctd	Invstgtd	Dist./Dpth.
Wells	__	__	__	____
Groundwater	__	__	__	____
Surface Water	__	__	__	____
Basements	__	__	__	____
Utility Corridor	__	__	__	____
Property Boundary	__	__	__	____
Other *(specify)*	__	__	__	____

Are THIRD-PARTY CONCERNS Addressed?

EX-SITU Soil Remediation: Landfill _____,Landfarm, ___
Quantity (cu. yds.): ___, Other

IN-SITU Remediation: VES ____, Air Injection _____,
Other

SOURCE REMOVED?

PLUME: Plume Expanding? ___,Shrinking? ____,Static?
How determined?

CASE HISTORY *(attach maps and additional pages as necessary)*:

DEGREE OF CONTAMINATION

SOIL: Vertical Extent and Magnitude Defined? ____. Horizontal Extent and Magnitude Defined? ___.
No. of Sample Points: ____. Lab Samples Analyzed? ____. Field Screening Conducted? _____.
Pre-remediation or Initial Concentrations at sampling points *(Contaminant, PPM)*:
Post-remediation or Defined Concentrations at sampling points *(Contaminant, PPM)*:

REMEDIAL ACTION(s) TAKEN *(Include duration of remedial method operation)*:
If applicable, has LANDFARM been closed? ___. Post-treatment landfarm contaminant levels (*ppm*):

GROUNDWATER: Extent and Magnitude Defined? ____. Number of Sampling Points:
Laboratory Samples Analyzed? ____.
Groundwater Monitoring *(check all methods used):* Monitoring Well(s) ___, Ground Probing ___, Piezometer(s) ___,
Temporary Sample Point(s) ____, Test Pit(s) ____, Other (explain)
Pre-remediation or Initial Concentrations at sampling points (*Contaminant,PPB*):
Post-remediation or Defined Concentrations at sampling points *(Contaminant, PPB)*:

REMEDIAL ACTION TAKEN *(Include duration of remedial method operation)*:
If applicable, have MONITORING WELLS been appropriately abandoned? ____.
(additional information, site sketch, etc.)

CLOSURE CRITERIA SUMMARY

1) Does soil and/or water quality data "exceed" any "chemical-specific" and "petroleum fraction" Risk-based Screening Level (RBSLs) (ie. WQB-7, human health standards, risk-based concentrations, beneficial use, etc.)?
YES – Soil____ - Groundwater____ NO – Soil____ - Groundwater

If there is an exceedance, list media and exceedances (proceed with questions #2, #3, and #4)-
If **No**, proceed to end of closure form (skip questions #2, #3, and #4).

2) If there is an exceedance, is the areal extent of the RBSL exceedance limited "on-site" for soil and groundwater (*if applicable*)?
YES – Soil____ - Groundwater____ NO – Soil____ - Groundwater

If exceedance may be offsite, define the number of borings/wells completed to evaluate the source and extent of contamination and the proximal distance of each boring, from the source area (*if applicable*).

3) Has sufficient data been collected from boring/wells to document temporal variations in soil/groundwater quality (dates of sampling events, number of sampling events, etc.) (*if applicable).*
YES – Soil____ - Groundwater____ NO – Soil____ - Groundwater

4) Define the extent and effectiveness of any soil and groundwater remediation efforts conducted to reduce the source of the contamination (*if applicable*).

I certify that, to the best of my knowledge, the information presented on and attached to this form is true and accurate. This recommendation for case closure is based on all available data as of (date) _____ *and is submitted by (print name)* _____.

*(signature)*_____,*(title/agency)* _____.

COMMITTEE RECOMMENDATION

1. ADDITIONAL CORRECTIVE ACTION REQUIRED. *(Specify, date, and initial)*_____

2. CLOSE. (Signatures)_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

*(Section Manager)*_____ Date: _____

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